



Boston, as viewed from the summit of Buck Hill, Blue Hills Reservation. (See Appendix K for photo information.)

SECTION 1. THE BLUE HILLS COMPLEX

1.1. INTRODUCTION

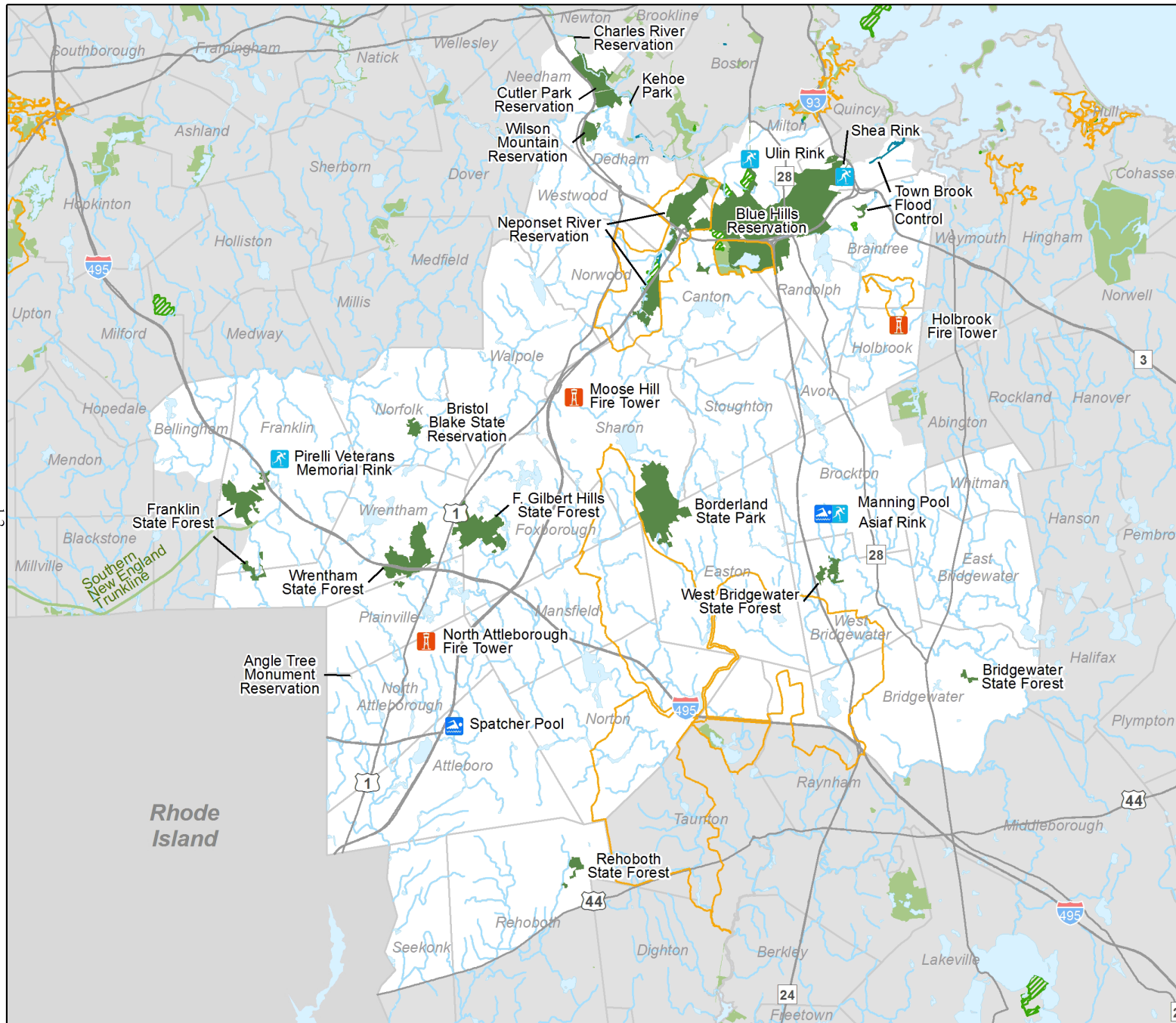
The Massachusetts Department of Conservation and Recreation (DCR) owns several properties south of Boston, in an area largely defined by Routes 95, 495, and 24. These properties, which are administered through the South Coast District, are collectively referred to as the Blue Hills Complex (i.e., the Complex). A map of properties that comprise the Complex is presented in Figure 1.1.1.

The area in which the Complex is located is ecologically, socially, and economically diverse. Populations range from fewer than 7,000 residents in West Bridgewater to more than 92,000 in Quincy. Some parks are located in small towns with an active agricultural presence (e.g., Rehoboth), while others are located in cities (e.g., Newton). Many are situated in bedroom communities for Boston and Providence. There is no common attribute that defines, nor sense of place that describes, this area. The Complex's parks are similarly diverse.

Parks within the Complex were acquired by a variety of state agencies, for a variety of purposes. Those closest to Boston were established by the Metropolitan Park Commission or its successor, the

Metropolitan District Commission (MDC). State forests within the Complex were established by the Department of Conservation, which later became the Department of Natural Resources (DNR). One property, Angle Tree Monument Reservation, was developed by the Department of Public Works; it was later transferred to the DNR. In 1975, the DNR became the Department of Environmental Management (DEM). Finally, in 2003, the DEM and MDC merged to create a single agency, the DCR.

The variety of controlling agencies and missions profoundly affected development of the Complex's parks. Their influence may be seen today in the variety of markers, architectural styles, and level of recreational development associated with individual parks. It may also be seen in the names used for these properties; Reservation primarily for former MDC properties and State Forest or State Park for former DEM properties. The Blue Hills Complex, therefore, represents a collection of parks with a common administrative structure, rather than a collection of parks with similar agency or management histories.



Blue Hills Complex

Figure 1.1.1

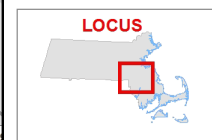
KEY

- DCR Properties in Complex
- Other DCR Properties
- Conservation Restrictions
- Other Legal Interest
- ACECs



0 1 2 3 4 5 Miles

Geographic information provided by
MassGIS and DCR GIS, 2016



1.2. RESOURCE MANAGEMENT PLANS

The DCR is required to prepare management plans for “all reservations, parks, and forests under the management of the department” (M.G.L. Chapter 21: Section 2F). These plans “shall include guidelines for the operation and land stewardship of the aforementioned reservations, parks and forests, shall provide for the protection and stewardship of natural and cultural resources and shall ensure consistency between recreation, resource protection, and sustainable forest management.”

This Resource Management Plan (RMP) provides an inventory and assessment of the environmental, cultural, and recreation resources; identifies current management practices and capabilities; and develops specific, implementable management recommendations to address the highest priority needs within the Blue Hills Management Complex.

Public Input

Public input is an important part of the RMP process. The legislative mandate that requires the preparation of management plans directs the Commissioner of the DCR to “seek and consider public input in the development of management plans, and ... make draft plans available for a public review and comment period through notice in the Environmental Monitor.”

There were two public input periods associated with the preparation of the Blue Hills Complex RMP; one at the start of the process and the second when the draft document was released. Both included public notification, posting in the Environmental Monitor, a public meeting, and a public comment period. Additional information on public participation in the development of this plan is provided in Appendix B.

Natural Heritage and Endangered Species Program (NHESP) Involvement

Under the Massachusetts Endangered Species Act (MESA) all “State agencies shall submit to NHESP any draft management plans they prepare for State owned lands on which State listed species are known to occur” (321 CMR 10.05(2)C.2). DCR coordinated with the NHESP throughout the planning process and submitted the internal review Draft RMP for review and comment as required by statute. Information on this coordination and review is presented in Appendix C.

During NHESP’s review, other MassWildlife personnel commented on aspects related to the ecology and management of game species. One set of comments, representing MassWildlife’s full range of interests, was submitted (French and Conlee 2016; see Appendix C).

Massachusetts Historical Commission (MHC) Involvement

State agencies must notify the Massachusetts Historical Commission (MHC) prior to undertaking a public project or funding or licensing a private project (950 CMR 71.04). Although management plans, such as RMPs, are not traditional projects and do not require submission of a formal Project Notification Form, DCR has elected to solicit comments in order to better protect the Commonwealth’s archaeological and historic resources. MHC’s comments are incorporated into the draft plan following the public comment period. Information on this coordination and review is presented in Appendix D.

Stewardship Council

Following public comment and revision, draft RMPs are submitted to the DCR Stewardship Council for review. Each draft RMP is presented at a public meeting of the Stewardship Council for their consideration. Once adopted, the RMP becomes final.

1.3. BLUE HILLS COMPLEX

This RMP covers the Blue Hills Complex, which includes 12 parks and a variety of properties and real assets that the DCR holds in fee. In addition, there are several properties in which the DCR holds legal interest or interest in regulatory review. (Figure 1.1) The term “park” is used generically throughout this RMP to refer to all manner of DCR parks, forests, and reservations.

Parks

The following 12 parks, and their associated properties, are included in the Blue Hills Complex:

- Blue Hills Reservation (Blue Hills)
- Cutler Park Reservation (Cutler Park)
- Wilson Mountain Reservation (Wilson Mountain)
- Neponset River Reservation (in part; upstream of Paul’s Bridge only)
- F. Gilbert Hills State Forest (F. G. Hills)
- Bristol Blake State Reservation (Bristol Blake)
- Franklin State Forest
- Wrentham State Forest
- Rehoboth State Forest
- West Bridgewater State Forest
- Bridgewater State Forest
- Borderland State Park (Borderland)

Each of these parks is covered in its own chapter, in Sections 2 through 13 of this RMP. Other properties, including connector parkways, rinks, pools, fire observation towers, and other real assets are only addressed in this section, as are DCR’s legal interests in non-DCR properties.

Connecting Parkway

The Metropolitan Park System of Greater Boston was designed as a series of reservations connected by parkways. These connecting parkways are linear parks that were originally designed as carriage roads intended to link and provide access to recreation areas (DCR 2007a). As the automobile emerged as

the primary means of transportation, parkways became increasingly integrated into the regional road network (DCR 2007a). Today, parkways serve multiple users, including drivers, walkers, runners, cyclists, and a variety of passive recreationists (DCR 2007a).

There are two connecting parkways partially within the Blue Hills Complex; the Blue Hills Parkway and the Furnace Brook Parkway. Both are associated with the Blue Hills Reservation. Within the Complex, the Blue Hills Parkway extends approximately 1.5 miles from Unquity Road, Milton, northward to the Neponset River. An additional 0.04 miles of parkway is located north of the Neponset River, outside the Blue Hills Complex and within the City of Boston. The Furnace Brook Parkway extends approximately 3.92 miles from Wampatuck Road, at the boundary of the Blue Hills Reservation, to Quincy Shore Drive, Quincy. Only 0.44 miles of this Parkway are within the Blue Hills Complex, which ends at the Southeast Expressway (I-93). Both parkways are historic, and include significant cultural resources. (Table 1.3.1.)



Blue Hills Parkway, Milton. (See Appendix K for photo information.)

Guidance on parkway planning, improvements, and maintenance is provided in *Historic Parkway Preservation Treatment Guidelines* (DCR 2007a). The types and frequency of ongoing maintenance activities are identified in Table 1.3.2.

Table 1.3.1. Cultural resources of Connecting Parkway within the Blue Hills Complex.

Parkway and Resource	Type ^a	Date ^b	Condition ^c	Integrity ^d	MHC # ^e	Guidance ^f
Blue Hills Parkway (<i>National Register</i>)	SI	1823–1962	-	M	BOS.VF, MLT.U	1
Blue Hills Parkway Canton Avenue Circle	ST	1900	3	M	MLT.962	1
Pine Tree Brook Culvert ^g	ST	1962	3	M	MLT.961	1
Blue Hills Parkway Tree Allee	ST	1897–1903	3	M	MLT.960	1
Blue Hills Parkway Median	ST	1897–1903	3	M	MLT.959	1
Blue Hills Parkway ^h	ST	1897–1903	3	M	BOS.9493, MLT.955	1
J. McLean Mile Marker	ST	1823	3	H	MLT.958	1
Blue Hills Parkway Median Islands	ST	1897–1903	3	M	MLT.957	1
Mattapan Bridge ^h	ST	1901–1903	4	M	BOS.9429, MLT.945	1
Mattapan Veterans Memorial Monument ⁱ	OB	1920s	2	H	BOS.9747	1
Furnace Brook Parkway (<i>National Register</i>) ^j	SI	1904–1960s	-	M	QUI.AS	1
Furnace Brook Parkway Extension	ST	1904–1924	4	H	QUI.9801	1
Furnace Brook Parkway Tree Canopy	LA	Early 20 th c	-	M	QUI.9084	1
Furnace Brook Parkway Extension Greenspace Mitres (2)	ST	Early 20 th c	3	H	QUI.9087	1
Furnace Brook Parkway Extension Culvert ^g	ST	Mid-20 th c	3	M	QUI.9806	1
Furnace Brook Parkway Extension Mitres (2)	ST	Early 20 th c	3	H	QUI.9805	1
Furnace Brook Parkway – I-93 Rotary and Bridges ^g	ST	1960s	3	M	QUI.9082	1

- a. Resource types include the following: AR = Archaeological; BU = Building; CM = Cemetery; LA = Landscape; LHD = Local Historic District; NRHD = National Register Historic District; OB = Object; SI = Site; and ST = Structure.
- b. Date of construction provided, when known.
- c. Preliminary condition assessment using the building system and equipment condition codes as used in the Massachusetts Capital Asset management Information System (CAMIS). The following codes are used: 1 = Excellent-easily restorable to like new condition; 2 = Good-routine maintenance required; 3 = Adequate-some corrective and preventative maintenance required; 4 = Fair-excessive corrective maintenance and repair required; 5 = Poor-renovation needed; and 6 = Fail.
- d. Integrity is a relative assessment of the condition of a resource's retention of its historic character-defining features; H = High; L = Low; M = Medium; and U = Unknown.
- e. Massachusetts Historical Commission inventory number; does not include Historic Archaeological numbers.
- f. The following guidance is offered for the ongoing maintenance of these cultural resources:
 1. Refer to *Historic Parkway Preservation Treatment Guidelines* (DCR 2007a).
- g. These resources are identified as “non-contributing elements” in the National Register listings for the Blue Hills Parkway and Furnace Brook Parkway.
- h. These resources are partially located in the Castle Island Complex.
- i. This monument is located in the Castle Island Complex.
- j. Additional historic resources associated with this parkway are located in the Castle Island Complex.

Table 1.3.2. Annual cycle of management activities for the Blue Hills and Furnace Brook parkways.

Activity	Spring ^a	Summer ^a	Fall ^a	Winter ^a
Blue Hills Parkway				
Cleaning - Catch Basins	A	A	A	A
Litter removal	E14	E14	E14	AN
Mowing and trimming	E14/AN	E14/AN	E14/AN	N/A
Street Sweeping	E30	E30	E30	N/A
Trash - Empty Barrels	E7	E7	E7	E7
Furnace Brook Parkway				
Graffiti removal	AN	AN	AN	AN
Litter removal	AN	AN	AN	AN
Mowing and trimming	E7-14	E7-14	E7-14	N/A
Street Sweeping	E30	E30	E30	N/A

a. Frequency codes are: A = Annually; AN = As needed; D = Daily, # times; E = Every # days; and N/A = Not applicable.

Other DCR Properties and Real Assets

Skating Rinks

There are four DCR-owned skating rinks; none are managed by the DCR. Information on these rinks is provided in Table 1.3.3. One additional rink, John P. Metropolis Skating Rink, was included in the RMP for the Blue Hills Planning Unit (DCR 2011). However, that rink is located within Ponkapoag Golf Course, which is now in a different complex, district, and region. For this reason, Metropolis Rink is not included in this RMP.

Max Ulin Skating Rink is located at 11 Unquity Road, Milton within the Blue Hills Reservation. It was constructed in 1952 and named in honor of Max Ulin, a former state senator and member of the Metropolitan District Commission (Chapter 152 of the Acts of 1952). The rink is leased by the Town of Milton and operated by Curry College. Its parking lot is almost exclusively used for the rink. See Section 2 for additional information on this rink.

The Mayor William T. Shea Memorial Rink is located at 651 Willard Street, Quincy. It was constructed in 1962 within the Blue Hills Reservation, and named through an Act of the Legislature (Chapter 204 of the Acts of 1962). It is currently operated by Michael B. O'Toole, Jr. LLC under an annual extension to a five-year permit issued in 2010. The rink's parking lots are also used by hikers and those using adjacent athletic fields and courts. See *Section 2. Blue Hills Reservation* for additional information on this rink.

The Representative John G. Asiaf Rink is located at 702 Belmont Street, Brockton. It is collocated with Manning Pool on the Brockton High School campus. The rink was constructed in 1968 and named in memory of John G. Asiaf, "a former member of the House of Representatives" (Chapter 242 of the Acts of 1967). It is operated by Facilities Management Corporation (FMC) under the terms of a 25-year Skating Rink Lease dated June 20, 2002. Parking is shared with Manning Pool and Brockton High School.

Table 1.3.3. Physical, political, and regulatory settings of skating rinks within the Blue Hills Complex.

	Ulin Rink	Shea Rink	Asiaf Rink	Pirelli Rink
Area (acres):	N/A	N/A	N/A	6.74
Management	Curry College	The O'Toole Company	FMC ^a	FMC ^a
Landscape Designation^b	Parkland	Parkland	None	Parkland
Legislative Districts:				
House	7 th Norfolk	1 st Norfolk	11 th Plymouth	10 th Norfolk
Senate	Norfolk, Bristol & Plymouth	Norfolk & Plymouth	Second Plymouth & Bristol	Second Middlesex & Norfolk
Regulatory Designations:	National Register District	None known	None known	None known

a. Facilities Management Corporation.

b. For a summary of DCR's landscape designations, see <http://www.mass.gov/eea/docs/dcr/ld/ld-factsheet-final.pdf>.

Staff Sergeant Robert Pirelli Veterans Memorial Rink is located at 910 Panther Way, Franklin. The land for the rink was sold to the Commonwealth by the Town in 1971, and the rink constructed in 1974. It was named in honor of Robert Pirelli, who was killed in the line of duty in Iraq (Chapter 33 of the Acts of 2008). It is operated by FMC under the terms of a 25-year Skating Rink Lease dated June 20, 2002. Parking is on site.



Pirelli Rink, Franklin. (See Appendix K for photo information.)

Swimming Pools

There are two swimming pools in the Complex, the Frank A. Manning Swimming Pool (Manning Pool) and the George I. Spatcher Swimming Pool (Spatcher Pool). (Table 1.3.4) Neither is managed by the DCR.

Table 1.3.4. Physical, political, and regulatory settings of swimming pools within the Blue Hills Complex.

	Manning Pool	Spatcher Pool
Area (acres):	3.3	3.2
Management	Brockton	Attleboro
Landscape Designation^a	None	None
Legislative Districts:		
House	11 th Plymouth	2 nd Bristol
Senate	Second Plymouth & Bristol	Norfolk, Bristol, & Middlesex
Regulatory Designations:	None known	None known

a. For a summary of DCR's landscape designations, see <http://www.mass.gov/eea/docs/dcr/ld/ld-factsheet-final.pdf>.

The DCR assists the cities of Attleboro and Brockton with staff training and facility maintenance. A 2011 Memorandum of Agreement

between the Massachusetts Department of Public Health (DPH) and the DCR specifies the steps that both parties will take “to facilitate compliance with 105 CMR 435.00: *Minimum Standards for Swimming Pools*” at all DCR-owned pools, including those not operated by the DCR. The DCR and DPH provide two days of training to municipal pool operators; this consists of one day of DPH inspection training and one day of pool administration and management training. The DCR helps municipalities correct deficiencies identified during DPH inspections by providing Park Support Operations (PSO) personnel to perform corrective measures. The DCR also provides a separate one-day course in pool management.



Manning Pool, Brockton. (See Appendix K for photo information.)

Manning Pool is located at 704 Belmont Street, Brockton. It is collocated with Asiaf Rink on the Brockton High School campus. The pool was constructed in 1972 and named in honor of Frank A. Manning, a former member of the House of Representatives and former Mayor of Brockton (Chapter 536 of the Acts of 1972). It received extensive renovations in 2006. The facility includes a swimming pool, spray deck, multi-component ADA accessible playground feature, and the following buildings and structures:

- Bathhouse
- Administration/Operations building
- Shade pavilion
- Shade shelters (2)

The high school's parking lots are used for both Manning Pool and Asiaf Rink.

Spatcher Pool is located at 79 North Avenue, Attleboro. It was constructed in 1973 and named in honor of George I. Spatcher, a former member of the House of Representatives (Chapter 92 of the Acts of 1973). The parcel on which the pool is located is surrounded on the north, east, and south by municipal recreation land (i.e., Hayward Field). The pool grounds include a swimming pool, wading pool, playground features, and the following buildings and structures:

- Buildings (3)
- Shade pavilion
- Shade shelters (4)

A dedicated parking lot includes 3 HP, and 30 other spaces. Additional parking, for approximately 60 vehicles, is located at Hayward Field. During the preparation of this RMP an unexecuted Memorandum of Agreement between the DCR and the City of Attleboro was identified; no executed agreements were located.

Angle Tree Monument Reservation

The boundary between the Massachusetts Bay Colony and the Plymouth Bay Colony was established in 1664. It extended from Hingham to Rhode Island, with only one bend in the line. This bend was located at “a certain old white oak tree, anciently marked, by some called the Station Tree, and by others called the Angle Tree” (Chapter 26 of the Acts of 1772–1773). In 1773, this line was declared the northern boundary for Bristol and Plymouth counties. Over time, the Angle Tree died and fell; it was replaced on November 29, 1790 with a nine-foot-tall slate monument known as the Angle Tree Monument.

In 1908 the Board of Harbor and Land Commissioners was directed to “take such measures as...may be necessary for the preservation” of the monument (Chapter 41 of the Resolves of 1908). In 1925, the Department of Public Works (DPW) was directed to acquire “such land as may be necessary to preserve and protect the Angle Tree Monument” (Chapter 289 of the Acts of 1925). This land, to be known as Angle Tree Monument Reservation, was to be owned by the Commonwealth and “under the joint control and management of, and shall be kept in proper condition and repair by, the towns of North Attleborough and Plainville.” The Commonwealth’s

interests were later transferred from the DPW to the DNR (Chapter 501 of the Acts of 1968).

Angle Tree Monument was placed on the National Register of Historic Places in 1976. In 1981 a brick building was constructed to house and protect the monument. This building is located partially on the reservation and partially on private land in Plainville. In 2001, the building was cleaned and restored, and the site improved.



Building at Angle Tree Monument Reservation; spring 2016. (See Appendix K for photo information.)

The Commonwealth has owned this 0.36 acre reservation at 659 High Street, Rear, North Attleborough since 1927 (Book 00774, Page 0294). In 1987, the Town of North Attleborough acquired an abutting 0.51 acre parcel (Book 3276, Page 0111). The DCR parcel is essentially a 990 foot long driveway from North Street to the building that houses the monument. The Town’s property, which is located just southeast of the monument, is used for visitor parking. An abutter uses approximately 355 feet of the park entrance road for residential access; no agreement was located for this use.

The reservation is entirely within the Seven Mile River (Orrs Pond) Outstanding Resource Waters area. No other regulatory designations were identified for this property.

Town Brook Flood Control Site

The waters of Town Brook originate in the Blue Hills Reservation and flow into Town Brook Flood Control Site (i.e., Old Quincy Reservoir) in Braintree (Chase 2006). From here, Town Brook flows through a highly artificial series of walled channels and an underground tunnel before reaching Town River Bay in Quincy.

The configuration of Town Brook is the result of the Water Resources Development Act of 1986, which authorized a federal flood protection project involving the Town River. The Town River Local Protection Project, as it was known, was conducted by the U.S. Army Corps of Engineers (ACOE) in association with the MDC. As part of this project, the MDC acquired eleven parcels in fee; they are identified in Table 1.3.5. In addition, the MDC obtained easements on 1.57 acres in Braintree and 15.55 acres in Quincy.

Table 1.3.5. DCR-owned parcels associated with Town Brook Flood Control Site.^a

Town	Address	Acres ^a	Landscape Designation
Braintree	0 Quincy Reservoir	64.56	Parkland
Quincy	101 School Street ^b	0.09	None
Quincy	105R School Street ^b	0.26	None
Quincy	107 School Street ^b	0.34	None
Quincy	113 School Street ^b	0.25	None
Quincy	119 School Street ^b	0.30	None
Quincy	129 School Street ^b	0.12	None
Quincy	37R Brackett Street	0.09	None
Quincy	00 Papile Lane	0.28	None
Quincy	23 Papile Lane	0.74	None
Quincy	35 Papile Lane	0.21	None
Total		67.24	

a. Approximate acreage (+/-), as reported in deeds.

b. Although the Quincy Assessor's office identifies these parcels as belonging to the MBTA, an Order of Taking by the MDC is recorded in Book 10067, Page 365.

Relocation of a 1,700 foot section of Town Brook is currently in development as part of the redevelopment of Quincy Center (Bartlett 2011). This relocation affects properties on which the DCR holds easements, but not land owned in fee.

Given its function, it is unsurprising that much of Town Brook is subject to flooding. Most of the property (51.33 acres, 79.94%) is within the 100-year flood zone. Approximately 1.30 acres, located at Town River Bay in Quincy, is subject to inundation from hurricane surge.

Fire Observation Towers

DCR's Fire Control Districts are based on counties; complex boundaries are not. As a result, the Blue Hills Complex includes portions of four Fire Districts: District 2 (Plymouth County); District 3 (Bristol County); District 4 (Norfolk County); and District 14 (South Middlesex County).

Within the Complex are two fire towers; one in North Attleborough (District 3) and the other in Sharon (District 4). Neither is located on DCR-owned property. (Table 1.3.6) The North Attleborough tower was constructed in 1972; it is located on Elmwood Street, Rear, within the City's World War I Memorial Park. (See Chapter 455 of the Acts of 1969.) A communications building is located near the base of the tower. The Sharon tower is located off Moose Hill Street, within the Massachusetts Audubon Society's (Mass Audubon's) Moose Hill Sanctuary; a tower has stood at this site since 1917. The presence and use of this tower is regulated via a 5-year lease agreement.

Table 1.3.6. Physical, political, and regulatory settings of fire observation towers within the Blue Hills Complex.

	Holbrook	North Attleborough	Sharon
Area (acres):			
Parcel (Acres)	0.46	N/A ^a	N/A ^b
Fenced-in Area (feet)	N/A	40 x 75	-
Perimeter (miles):			
	0.19	N/A	N/A
Landscape Designation^c			
	None	N/A	N/A
Legislative Districts:			
House	3 rd	14 th	8 th
	Norfolk	Bristol	Norfolk
Senate	Norfolk & Plymouth	Norfolk, Bristol, & Middlesex	Bristol & Norfolk
Regulatory Designations:			
	None known	None known	None known

a. Located on municipal property.

b. Located on private property.

c. For a summary of DCR's landscape designations, see <http://www.mass.gov/eea/docs/dcr/ld/ld-factsheet-final.pdf>.

There is no longer a fire tower in Holbrook, but DCR owns the 80 Pine Street parcel where the tower once stood. (Table 1.3.6) The fire tower was constructed in 1927 and dismantled in 2006; it is listed in MACRIS (HLB.906). Only concrete footings remain at the site, which now functions as a vegetated buffer between Pine Street and adjacent residences.

Legal Interests

In addition to real assets, DCR holds a number of legal interests in non-DCR properties. This includes Conservation Restrictions, access rights, and regulatory interests within Areas of Critical Environmental Concern.

Conservation Restrictions (CRs)

The Blue Hills Complex includes several private and municipal properties on which the DCR holds CRs. (Table 1.3.7.) CRs are legal instruments through which a landowner transfers a legal interest in the development of their property to the DCR. By acquiring these rights, the DCR is able to limit development. The DCR is currently prioritizing the monitoring of its conservation restrictions. Locations of CRs are depicted on the Complex map (Figure 1.1) and on individual property maps.

Table 1.3.7. DCR-held conservation restrictions for properties associated with the Blue Hills Complex.

Town	Owner	Acres ^a
Milton	Bartol	56.84
Milton	Boy Scouts - Camp Sayre	107.54
Braintree	Town of Braintree	10.41
Braintree	Town of Braintree	8.69
Canton	Codex Corporation	54.99
Canton	Homans	34.69
Canton	The Trustees of Reservations	125.78
Total		398.94

a. Approximate acreage (+/-), as reported in the conservation restrictions.

Access Rights

The DCR may hold easements or deeded rights of access on private lands that abut DCR-owned land. Information on known access rights is presented in individual chapters, as appropriate.

Areas of Critical Environmental Concern (ACECs)

ACECs are places in Massachusetts that receive special recognition because of the quality, uniqueness, or significance of their natural and cultural resources. The DCR has a statutory role in their stewardship. Within ACECs, the DCR shall “take actions, administer programs, and revise regulations in order to” acquire useful scientific data; preserve, restore, or enhance resources; and ensure that activities in or impacting the area

minimize adverse effects on seven specific resource values. (301 CMR 12.00; Appendix E)

There are five ACECs in the Blue Hills Complex; the DCR owns or holds a legal interest in properties within two of these. (Table 1.3.8) Their locations are depicted on the Complex map (Figure 1.1). Additional information on ACECs may be found at <http://www.mass.gov/eea/agencies/dcr/conservation/ecology-acec/acec-designations.html>.

Table 1.3.8. Areas of Critical Environmental Concern (ACEC) within the Blue Hills Complex, and DCR parks that occur within each ACEC.

ACEC	Park(s) within ACEC
Canoe River Aquifer	Borderland
Cranberry Brook Watershed	None
Fowl Meadow & Ponkapoag Bog	Blue Hills Neponset River
Hockomock Swamp	None
Three Mile River Watershed	None

1.4. NATURAL RESOURCES

Physical Features

The Complex is physically diverse. Several parks are hilly (e.g., Blue Hills), while those associated with river basins have relatively gentle relief (e.g., Bristol Blake). The underlying geology differs among and within parks; granites, sandstone, siltstone, slate, diorite, conglomerates, and even coal are present beneath the region. Historic quarries are present in two parks, and may also be present in a third.

Water Resources

The Complex’s parks are located in the following six watersheds:

- Blackstone
- Charles
- Narragansett Bay
- Neponset
- Taunton
- Weir River

Depending on the park, and the location within the park, water flows either northeastward toward Boston Harbor or southwestward toward Mount Hope Bay and Narragansett Bay in Rhode Island.

Three parks send water toward both Boston Harbor and Narragansett Bay.

Nearly all parks have flowing waters. Such waters are both ecologically and culturally significant. Many streams and rivers have been highly modified to control flood waters or power mills. Six parks currently have operational dams. (See Section 1.7 for additional information.) Several other parks may have had historic mills.

Flood Zones

Properties with rivers, streams, and wetlands may be subject to flooding. Flooding impacts vary among properties; the potential impacts of 100- and 500-year floods are addressed at the property level.

Hurricane Surge Inundation Zones

Only one property, Town Brook Flood Control Site, is located near the coast and predicted to be subject to storm surge associated with a hurricane. The potential impacts to Town Brook Flood Control Site were described above (Section 1.3). There is no other hurricane surge information in this RMP.

Climate Change

“Unequivocal evidence...shows that the atmospheric concentrations of important greenhouse gases...have increased over the last few centuries” (Cubasch et al. 2013:121). Associated with increased atmospheric CO₂ levels are: sea level rise, increases in temperature trends, changes in the frequency and intensity of extreme weather events, changes in the frequency and intensity of precipitation, and an increase in CO₂ and decrease in pH in oceans (U.S. Global Change Research Program 2014). Of these, only the projected impacts of sea level rise may be readily assessed at the park level. The projected impacts on fish and wildlife habitat are used as an indicator of overall climate impacts on natural resources. This information is presented by habitat type below, and is not included in individual park chapters.

Projected Sea-Level Rise

Potential impacts of sea-level rise were evaluated using information developed by the Intergovernmental Panel on Climate Change (IPCC; Church et al. 2013). The model used (i.e., RCP 8.5) predicts a 0.3m (12 inch) likely increase in global mean sea level over the next 30–50 years (i.e., from

present through 2046–2065). This model was selected because it considers the highest concentrations of gasses and aerosols of the four scenarios modeled by the IPCC; planning based on this model errs on the side of caution. A 30–50 year time frame was selected over the alternative 100-year time frame model, because of lower variability associated with predicted rise in likely mean sea-level. In addition, it is anticipated that this RMP will be revisited within the next 30 years, and that improved models will be available at that time to better predict sea-level rise in the second half of this century.

Only one property, Town Brook Flood Control Site, is susceptible to the impacts of climate change-related sea-level rise under this scenario.

Projected Impacts on Fish and Wildlife Habitat

Manomet and MassWildlife (2010) assessed the vulnerability of Massachusetts’ habitat types to climate change. Their results indicate two vulnerable and two critically vulnerable habitat types within the same geographic area as the Blue Hills Complex. Anticipated responses to climate change, by habitat type, are identified in Table 1.4.1.

Table 1.4.1. Predicted responses of habitat types to climate change.^a

Predicted Response^b	Habitat Type^c
Likely to Greatly Benefit	Southern/central hardwood forest
Likely to Benefit	Warm water ponds, lakes, and rivers
Less Vulnerable	Atlantic white cedar swamp Hardwood swamps Pitch pine-scrub oak Riparian forests Shrub swamp Vernal pools
Vulnerable	Emergent marshes Northern hardwood forest
Critically Vulnerable	Brackish marsh Intertidal mudflats and sandflats

a. From Manomet and MassWildlife (2010).

b. Predicted responses to climate change are: Likely to Greatly Benefit = Increase in extent; Likely to Benefit = Moderate increase in extent; Less Vulnerable = Either no change, or moderate change, in extent; Vulnerable = At risk of being greatly reduced in extent; and Critically Vulnerable = At risk of being eliminated or nearly so.

c. These habitat types are either known to occur, or are likely to occur, within the Complex.

Among the Vulnerable habitat types is emergent marshes. Several state-listed species are associated with this habitat type at Cutler Park Reservation, Neponset River Reservation, and West Bridgewater State Forest.

Rare Species

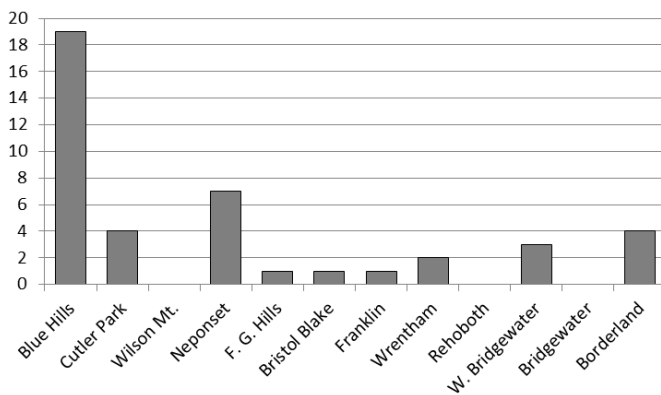
State-listed Species

Thirty-one state-listed species are documented from parks in the Complex. (Table 1.4.2) The number per park ranges from 0–19. (Figure 1.4.1) Twenty-two are known from only one park, six from two parks, one from three parks, and one from four parks. In addition, there are no state-listed species associated with Angle Tree Monument Reservation, Town Brook Flood Control Site, or the pools, rinks, and fire towers.

Table 1.4.2. Number of state-listed species, by type and state rank, known to occur on DCR-owned properties in the Blue Hills Complex.

Type	Endangered	Threatened	Special Concern	Total
Amphibians	0	1	1	2
Birds	1	1	2	4
Invertebrates	0	4	6	10
Plants	4	3	0	7
Reptiles	2	1	2	5
Data sensitive animal	1	2	0	3
Total	8	12	11	31

Figure 1.4.1. Number of State-listed species, by park.



The Complex's rare species may be generally categorized as associated with the following habitats:

- Wetlands and wetland complexes, including bogs, emergent marshes, and forested wetlands
- Dry, rocky hillsides

Additional information on rare species is presented at the property level.

Federally-listed Species

There are no federally-listed species known from the Complex's parks.

Priority Habitat

Priority Habitat is a regulatory term that refers to the geographic extent of habitat for species protected under MESA. Activities within Priority Habitat may require review under MESA. (See Section 1.10.) Three parks have no Priority Habitat, four have less than six percent of their area so designated and the remaining five parks have between 31.5% and 90.2% Priority Habitat. Additional information on Priority Habitat is presented at the property level.

Vegetation

Information on the parks' vegetation is inconsistent. Some parks (i.e., Blue Hills, Neponset River, and Bristol Blake reservations) have been well-documented; for others there is little to no information. Information on vegetation is summarized in individual chapters as available and appropriate.

Invasive Species

There is no complex-wide information. Available information is presented at the property level.

Priority Natural Communities

Natural communities are assemblages of plant species that occur together in space and time (NHESP 2016). The amount and quality of information on these communities varies greatly among parks. Verified information comes from the NHESP data set (Harper 2013). Supplemental site-specific data are provided when available. This information is presented at the property level.

Twenty-two communities are known from the Complex. Seven of these have state ranks of S1–S3,

and are considered Priority Natural Communities; they are:

- Atlantic White Cedar Bog (S2)
- Inland Atlantic White Cedar Swamp (S2)
- Open Talus/Coarse Boulder Community (S2)
- Ridgetop Pitch Pine-Scrub Oak (S2)
- Alluvial Red Maple Swamp (S3)
- Level Bog (S3)
- Woodland Vernal Pool (S3)

Additional information on these community types is available in a series of fact sheets at <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/natural-communities/natural-community-fact-sheets.html>.

Forests

DCR monitors its forests through an ongoing inventory process. Monitoring plots associated with the Continuous Forest Inventory (CFI) are located in former DEM properties. Information is incorporated into individual chapters as available and appropriate.

Wildlife

Site-specific information is largely lacking. However, a variety of resources are available for the region (e.g., Cardoza et al. n.d., Cardoza and Mirick 2009). Because bird watching is a popular recreational activity, information on birds is available for most parks; it is presented at the property level.

1.5. CULTURAL RESOURCES

The Complex's archaeological and historic resources reflect the region's Native American history, agrarian and subsequent residential and industrial development, development of early park and recreation facilities, institutionalized conservation, and cold war missile defense. A summary of the Complex's cultural resources is presented in Table 1.5.1.

An overview of the cultural development of the Blue Hills Complex is provided in Appendix F.

Table 1.5.1. Summary of cultural resources in the Blue Hills Complex.

Type	Number
National Historic Landmark	1
NR - Individually listed properties ^a	17
NR - Historic Districts ^a	1
MHC documented resources - Historic	85
MHC documented resources - Archaeological ^b	112
Verified resources not on NR or MHC inventories	208
Resources documented but unverified ^c	22

- Properties and districts listed in the National Register of Historic Places are automatically listed on the MHC inventory. For the purposes of this table, resources listed on the Register are not included among the number of MHC documented resources.
- Information on these resources is not publically available. Because of this, most are not listed in Cultural Resource tables in Sections 2–13. However, archaeological resources on the National Register are included in these tables.
- Resources reported through various sources, but not yet field verified or confirmed.

1.6. RECREATION RESOURCES

Collectively, the Complex's parks offer a broad variety of recreation activities. Common activities include dog walking, hiking, mountain biking, and nature study. Uncommon recreation activities and facilities include rock climbing, an off-leash dog area, one of three disc golf courses in the South Region, one of three downhill ski areas in the State's park system, and three of eight parks in the Commonwealth open to OHV use.

1.7. INFRASTRUCTURE

The amount and types of infrastructure vary among properties. In general, parks with administrative or operations facilities (e.g., Borderland) tend to be highly developed as do parks with recreation facilities (e.g., The Honorable Marie-Louise Kehoe Park).

Buildings and Structures

Dams and dikes are associated with many of the Complex's parks. (Table 1.7.1) A few are modern, but most are historic. In general, these dams are owned by the DCR, in poor condition, have multiple deficiencies, and are not being actively maintained. Detailed information on individual dams is presented at the property level; an overview is presented in Table 1.7.1.

Table 1.7.1. Dams and dikes of the Blue Hills Complex.

Name	National ID #	Municipality	Park/Facility	Jurisdictional ^a	Size Class ^b	Hazard Code ^c	Condition ^d	Owner ^e	Operator ^e
Unnamed dam ^f	N/A	Needham	Cutler Park	N	-	-	-	DCR	DCR
Pine Tree Brook Reservoir Dam	MA00824	Milton	Blue Hills	N	-	N/A	G	DCR	DCR
Pine Tree Brook Flood Control Dam	MA00825	Milton	Blue Hills	Y	L	S	S	Milton	Milton
Blue Hills Reservoir Dam	MA00826	Quincy	Blue Hills	Y	-	H	S	DCR	MWRA
St. Moritz Pond Dam	MA03373	Quincy	Blue Hills	N	-	N/A	F	DCR	DCR
Ponkapoag Pond Dam	MA03107	Canton	Ponkapoag Golf Course	Y	-	S	G	DCR	DCR
Sunset Lake Dam	MA03113	Foxborough	F. G. Hills	Y	I	S	P	DCR	DCR
Bristol Blake State Reservation Dam	MA00749	Norfolk	Bristol Blake	Y	I	S	F	DCR	DCR
Mirror Lake Dam ^g	MA02553	Norfolk	N/A	Y	-	S	-	Norfolk	Norfolk
West Meadow Dam ^h	MA01072	W. Bridgewater	West Bridgewater	Y	I	S	P	DCR	DCR
Borderland State Park Dam #1	MA03277	Sharon	Borderland	Y	-	L	P	DCR	DCR
Borderland State Park Dam #2	MA03178	Sharon	Borderland	Y	I	L	P	DCR	DCR
Borderland State Park Dam #3	MA03180	Sharon	Borderland	Y	I	L	P	DCR	DCR
Leach Pond Dam	MA03036	Sharon	Borderland	Y	I	L	P	DCR	DCR
Upper Leach Pond Dam	MA03037	Sharon	Borderland	Y	I	L	P	DCR	DCR
Upper Leach Pond Dike #1	MA03269	Sharon	Borderland	Y	I	L	P	DCR	DCR
Upper Leach Pond Dike #2	MA03270	Sharon	Borderland	Y	I	L	P	DCR	DCR
Upper Leach Pond Dike #3	MA03271	Sharon	Borderland	Y	I	L	P	DCR	DCR
Pud's Pond Dam	MA03038	Easton	Borderland	Y	I	L	P	DCR	DCR

- a. N = No, the dam or dike is not regulated by the DCR Office of Dam Safety (ODS); and Y = Yes, dam or dike is under the jurisdiction of the ODS (i.e., jurisdictional).
- b. Size Classes include: I = Intermediate; and L = Large.
- c. Jurisdictional dams are assigned one of the following hazard codes, based not on condition, but on potential impacts in the event of a dam failure: H = High; L = Low; S = Significant; and N/A = Not applicable.
- d. Condition Codes are: F = Fair; G = Good; P = Poor; and S = Satisfactory.
- e. Owner and Operator codes include: DCR = Massachusetts Department of Conservation and Recreation; Milton = Town of Milton; MWRA = Massachusetts Water Resources Authority; and Norfolk = Town of Norfolk.
- f. ODS Safety data indicate no dam at this location. However, Lynch (1973) indicated that the road along the eastern side of Kendrick Pond was constructed atop a dam. Visual inspection in 2015 indicated connecting culverts between the pond and the Charles River such that high water levels in the pond result in discharge to the river.
- g. The DCR holds a deeded interest in water flow through this dam, but neither owns nor operates it. (See Section 7 for additional information.)
- h. Although ODS records indicate DCR as the owner and manager, historic documents suggest an ownership and/or management interest by MassWildlife. See *Section 11. West Bridgewater State Forest* for additional information

Trails

There are three regional trails that connect to the Complex's parks; they are:

Claire Saltonstall Bikeway. This trail extends 135 miles from the Esplanade, in Boston, to downtown Provincetown. It passes along the Neponset River Reservation and through the Blue Hills. Maps of this bikeway are available at <http://www.masspaths.net/bikeways/ccbw/>.

Bay Circuit Trail & Greenway. This trail is actually a 230-mile-long network of trails that extend from

Plum Island, Newburyport, to Kingston Bay, Duxbury. It passes through Borderland State Park. Additional information may be found at <http://www.baycircuit.org/>.

Warner Trail. This 30-mile-long regional trail originates at Dedham Street, Sharon and ends in Diamond Hill State Park, Cumberland, Rhode Island. Along its path, it passes through Wrentham and F. G. Hills state forests. On Mass Audubon's Moose Hill Sanctuary in Sharon, the Warner Trail passes by the base of DCR's fire observation tower. Additional information may be found at <http://warnertrail.org/>.

1.8. INTERPRETATION

There is no Complex-wide interpretive programming. Instead, programming takes place at the property level. Parks with a Visitor Services Supervisor (i.e., the Blue Hills and Borderland) offer the most programs. These Supervisors, along with the Regional Interpretive Coordinator, provide occasional programming at other parks within the Complex. Partners and Friends groups also provide interpretive programming to visitors. Information on specific programming is presented by park.

1.9. MANAGEMENT RESOURCES

Administrative Structure

All parks in this RMP are part of the Blue Hills Complex. This Complex and the Fall River Heritage Complex jointly constitute the South Coast District; which is one of three districts in the DCR's South Region.

Staffing

Park management is a challenging task that requires expertise in a variety of disciplines. It is carried out by DCR staff, with supplemental support provided by state and municipal government employees, friends groups, and volunteers.

DCR Staffing

The operation and management of properties within the Complex requires the participation of regional and district personnel, as well as DCR staff from other bureaus and offices. Day to day management primarily involves DCR personnel at the region, district, and complex level.

Region. Administrative, clerical, and support functions are performed by personnel located in the regional office in Carver. The Regional Director performs a variety of administrative functions, including supervision of regional staff and District Managers. Clerical and fiscal support (e.g., procurement, payroll, processing seasonal employee paperwork) is provided by the regional Business Management Specialist, Clerk, and Administrative Assistant. A regional mechanic services and repairs vehicles within the Complex.

District. The South Coast District Manager reports to the Regional Director, and is responsible for the management of all properties, and supervision of all

Field Operation Team Leaders, within the District. The South Coast District includes two complexes, the Blue Hills Complex and the Fall River Heritage Complex.

Complex. Each complex has a Field Operations Team, comprised of all personnel from properties within that complex, and one Field Operations Team Leader. (FOTL; Table 1.9.1) There are 17 year-round positions; one is currently vacant. The FOTL has the ability to allocate resources within the Complex in order to improve park operations. Resources may also be reallocated on a temporary basis to assist with special projects that require staffing, skill sets, or equipment unavailable at any one park.

Park Rangers and Visitor Services Supervisors are not part of the Field Operations Team, but are based at properties within the Complex and work closely with the team to advance the agency's mission. A Regional Interpretive Coordinator, based at the Regional Office in Carver, oversees the Visitor Services Supervisors and conducts interpretive programming in the Complex. Bureau of Forestry and Fire Control personnel work closely with field staff to detect and suppress wildfires, promote fire safety, and help maintain fire breaks and roads. There is one Fire Warden, five Laborer I, and one State Firefighter positions per Fire Control District.

Table 1.9.1. DCR personnel assigned to the Blue Hills Complex.

Job Title	Number of Positions^a
<i>Year-round Personnel</i>	
Administrative Assistant II	1
District Manager ^b	1
Forest and Park Regional Coordinator (Field Operations Team Leader)	1
Forest and Park Supervisor I	2
Forest and Park Supervisor II ^c	4
Forest and Park Supervisor III	1
Laborer I	2.5
Ranger I ^b	1
Ranger II ^b	2
Recreation Facilities Supervisor I	0.5
Recreation Facilities Supervisor III	1
Visitor Services Supervisor ^b	1
<i>Seasonal Personnel^d</i>	
Forest and Park Supervisor I (Long-term)	4
Forest and Park Supervisor I (Short-term)	1
Forest and Park Supervisor II (Long-term)	1
Laborer I (Long-term)	4
Laborer I (Short-term)	8
Laborer II (Short-term)	1
Lifeguard I (Short-term)	15
Lifeguard II (Short-term)	2
Office Support Specialist (Long Term)	1
Ranger I (Long Term) ^b	3
Ranger I (Short Term) ^b	1
Recreation Facility Repairer (Long-term)	1
Recreation Facility Supervisor I (Short-term)	1
Summer Worker (Short-term)	1
Visitor Services Supervisor (Long Term)	1

- a. Number of position is based on 2016 staffing levels.
- b. These positions are not part of the Field Operations Team, but provide direct support of parks within the Complex.
- c. One of these positions has been vacant since 2014.
- d. Long-term seasonal positions begin prior to the second Sunday before Memorial Day; short-term seasonal positions begin after that date.

Partnerships and Volunteers

There are no Complex-wide organized partnerships or volunteer programs, but there are two friends groups associated with three parks within the Complex. There is also an advisory committee associated with three state forests. Information on these groups is presented by park. There are no formal agreements with these groups.

Public Safety

The Massachusetts State Police has primary law enforcement authority on state-owned lands. Local police provide additional law enforcement within their respective jurisdictions. The Massachusetts Environmental Police provide primary enforcement of hunting, fishing, boating, OHV, and snow vehicle regulations.

Fire control is provided by local fire departments with assistance from DCR's Fire Districts 2, 3, 4, and 14. Municipalities also provide emergency medical response. Rangers, lifeguards, and other trained DCR personnel may provide first aid.

Park Operations

DCR personnel perform a variety of activities related to the operation and maintenance of the Complex's resources and facilities. These activities differ among parks and, within each park, differ from day to day and among seasons. However, general routines are followed.

Buildings and grounds related activities include: cleaning, painting, minor carpentry, electrical and plumbing tasks, mowing grass, removing leaves, picking up litter, emptying trash barrels, and graffiti removal.

Visitor services related activities include: ParksPass sales and processing, providing interpretive programming, responding to visitor questions, ensuring public safety, and promoting awareness of park regulations and enforcing those regulations.

Administrative activities include: employee scheduling and supervision, report preparation, revenue processing, coordinating volunteer activities and special events, and budget preparation.

General Budgetary Information

Typical Funding

Three major types of funds support the operations, maintenance, and capital improvement of DCR facilities. They are:

Operating Budget. The annual operating budget supports daily operations and maintenance including utilities, supplies, equipment leases, administration, and the maintenance and minor repair of facilities, vehicles, and equipment.

Capital Budget. This supports projects (e.g., construction, repair) and items (i.e., equipment) with a per-unit cost of at least \$5,000 and an expected lifespan of at least seven years. They are identified and funded through a five-year capital plan. These plans identify proposed capital projects, their costs, and the year in which they are to be funded. Recent examples within the Complex include upgrades to athletic fields and the construction of a new bathhouse and comfort station at the Blue Hills Reservation.

Deferred Maintenance. These funds are used for infrastructure repair that exceed typical maintenance, but do not rise to the level of a capital project. They may also be used to address emergency capital projects for which funds have not been programmed. Each region is allotted deferred maintenance funds on an annual basis; the Regional Director determines how these funds are to be expended. Recent examples within the Complex include repairs or upgrades to bathrooms at F. Gilbert Hills and Borderland, upgrades to lighting at Borderland's main parking lot, and repairs to the boardwalk at Cutler Park.

Supplemental Funding

In addition to operations, capital, and deferred maintenance funds, DCR facilities may receive funding through other sources including grants, legislative earmarks, the Conservation Trust Fund (e.g., donations placed into "iron rangers," secure metal donation boxes), dedicated funds associated with individual properties (e.g., telecommunication tower fees), retained revenues (e.g., day use fees), and in-kind contributions.

1.10. MANAGEMENT PRACTICES

Management of the Complex's natural, cultural, and recreation resources is complicated and subject to a variety of laws, regulations, policies, and agreements. It is also subject to available resources and staffing. This section describes current management practices and identifies relevant regulations, other legal considerations, and policies that guide this management. Select Massachusetts regulations are presented in Appendix E.

Natural Resources

Best Management Practices

The Bureau of Planning, Design & Resource Protection has developed a series of Best Management Practices (BMPs) for guiding common park activities with the potential to affect natural or cultural resources. At present there are 7 natural resources BMPs available. They are available at <http://www.mass.gov/eea/agencies/dcr/conservation/planning-and-resource-protection/best-management-practices.html>.

Research Permits

Research Permits are required for all ecological research on DCR properties. Additional state and federal permits may be required, depending on the nature and location of research. Research within wetland and river jurisdictional areas may also require regulatory review and approval from the local conservation commission.

Water Resources

Sanitary Waste. The sub-surface disposal of sanitary wastes is regulated by a variety of regulations, including Title 5 of the State Environmental Code (310 CMR 15:00), Underground Injection Control regulations (310 CMR 27:00), and groundwater discharge permits (314 CMR 5.00). These regulations apply to all septic systems in the Complex.

Storm Water Management. Activities on DCR properties that affect the quantity or quality of storm water are regulated by a National Pollutant Discharge Elimination System (NPDES) storm water management plan (DCR 2007b). This plan describes control measures that the DCR uses to satisfy NPDES Phase II permit requirements for transportation and non-traditional Municipal Separate Storm Sewer Systems (MS4s). Although emphasis is placed on parks in the Greater Boston area, the plan is applicable to the entire DCR park system. For additional information see <http://www.mass.gov/eea/agencies/dcr/conservation/stormwater-mgmt/>.

Outstanding Resource Water (ORWs). ORWs are designated based on their "outstanding socio-economic, recreational, ecological and/or aesthetic values." Discharges to these waters are regulated by

Massachusetts Surface Water Quality Standards. (314 CMR 4:04(3); Appendix E) Four of the Complex's parks are entirely or partially located within an ORW.

Wetlands. Activities within a wetland resource area or buffer are regulated by the Massachusetts Wetland Protection Act. (310 CMR 10:00; Appendix E) A BMP is available to help field operations personnel comply with these requirements.

Vernal Pools. Certified vernal pools are protected under a variety of state laws, including the Wetlands Protection Act, Title 5 of the State Environmental Code, and the Massachusetts Forest Cutting Practices Act. A BMP on vernal pool certification on DCR lands is available.

Rare Species

MESA protects rare species and their habitats by prohibiting the "take" of any plant or animal listed as Endangered, Threatened, or Special Concern (http://www.mass.gov/dfwele/dfw/nhESP/regulatory_review/mesa/mesa_home.htm). Projects within identified Priority Habitat of rare species must undergo review by the NHESP, unless otherwise exempted under the law. (See 321 CMR 10:00 for the full definition of "Project.") Many staff and volunteer activities that take place within the Complex (e.g., invasive species removal, trail work) meet the definition of Project and must go through regulatory review if they are to occur in Priority Habitat.

State agencies have the following special obligations under MESA:

- Use their authorities in furtherance of the purposes of MESA and "use all practicable means and measures to avoid or minimize damage."
- Submit draft management plans, such as RMPs, to the NHESP for review.
- State-owned lands "that provide habitat for state-listed species shall be managed for the benefit of such listed species;" agencies "shall give management priority to the protection, conservation, and restoration of" state-listed species on state-owned lands. All "practicable means and measures shall be taken to resolve conflicts between the protection, conservation, and restoration of state-listed species ... and

other uses of such lands in favor of the listed species."

These requirements guide operations activities in, and planning activities for, Priority Habitat in the Complex.

Vegetation

There is no single management plan for the Complex's vegetation. The *de facto* management policy is to permit populations of most species of plants to increase or decrease without human intervention. Exceptions include the maintenance of lawns, recreation fields, and other turf areas; fire break maintenance and management; removal of hazardous trees; removal of plantations of non-native trees; timber harvests; road and trail maintenance; removal of non-native or invasive plants; and vegetation cutting associated with the management of plant or wildlife habitat.

Invasive Species. Continuous Forest Inventory (CFI) sampling protocols include the recording of invasive species observed within sampling plots (DCR 2010a). There are no other Complex-wide monitoring or eradication efforts.

Forests. A total of twenty-six CFI monitoring plots are located in six parks within the Complex. A series of forestry related metrics, including the number of trees five or more inches in diameter, tree regeneration, amount of coarse woody debris, presence of invasive plants, and presence of tree diseases are collected at each plot. On average, each plot is visited, and data collected, once every ten years.

Wildlife

There is no single wildlife management plan for the complex. The *de facto* management policy is to permit most wildlife populations to increase or decrease without human intervention. Exceptions include rare species management; fishing; and the hunting of game species. (See Recreation Resources: Hunting and Fishing, below.)

Cultural Resources

The DCR's Office of Cultural Resources (OCR) provides technical assistance on issues relating to the preservation of the agency's vast and diverse portfolio of cultural resources. A copy of the DCR

Cultural Resources Policy has been included as Appendix G.

The OCR is also responsible for overseeing the historic preservation and regulatory compliance responsibilities of the agency. It assesses regulatory needs and, when applicable, notifies the MHC through the filing of a Project Notification Form or Environmental Notification Form for any proposed projects undertaken, funded, permitted, or licensed in whole or in part by the agency. This is done so that the MHC may make a Determination of Effect of the project on archaeological and historic resources. Projects may be large or small and involve any level of impact on an above or below ground cultural resource. Finally, the OCR coordinates all archaeological survey, testing, and excavation with the State Archaeologist at the MHC through an archaeological permit.

OCR defines a cultural resource as a district, site, building, structure, landscape, object, or ethnographic resource that is at least fifty years old and has important historical, cultural, scientific, or technological associations. Cultural resources also include pre-historic or historic archaeological sites containing physical remains or indications of past human activity and/or any artifacts that have been constructed or manipulated by human influence and holding potential significance for understanding past, present, or future human behavior.

There are a number of different designations for individual cultural resources and districts in Massachusetts; including local designation, inclusion on the statewide inventory, listing in the State Register of Historic Places, listing in the National Register of Historic Places, and designation as a National Historic Landmark. Although these designations indicate different levels of significance and compliance, for the purposes of DCR's cultural resource policy and statutory requirements, projects involving any of these resources may require review and approval by, and/or consultation with, the MHC.

Best Management Practices

In order to provide technical support to field operations staff, OCR has developed a series of BMPs to guide the day-to-day management of common cultural resources in our state parks. At present there are 14 cultural resources BMPs available. (See

<http://www.mass.gov/eea/agencies/dcr/conservation/planning-and-resource-protection/best-management-practices.html> for these BMPs.) Although many of these practices may be performed without any level of statutory review or compliance, it is important to coordinate with OCR staff in order to determine whether any compliance is required. This is especially important with resources or districts that are designated at the local level, as these designations carry specific guidelines that may differ from those at the state level. BMPs applicable to specific resources are identified under "Guidance" in Cultural Resources tables in Sections 2–13.

Archaeological Resources

Massachusetts law requires the review of all sub-surface disturbances on state property. The DCR's archaeologist holds a general archaeology permit from the MHC that allows them to provide initial review of activities that result in sub-surface disturbance. The DCR archaeologist is the primary reviewer of such projects and activities in the Complex.

Underwater Archaeological Resources. The inspection, investigation, or removal of underwater archaeological resources is regulated under Massachusetts law (M.G.L. 6:179–180). No person may remove, displace, damage or destroy any underwater archaeological resource except in conformity with permits issued by the Massachusetts Board of Underwater Archaeological Resources (BUAR). This applies to both coastal and inland waters. Additional information is available at <http://www.mass.gov/eea/agencies/czm/buar/>.

Native American Hunting, Fishing, and Gathering Rights. Most Native American tribes and indigenous groups have the inherent right to be self-governing, including regulating their landscapes and resources. The right to hunt and fish was guaranteed to many tribes in their treaties with the United States and it is presumed to exist even if not mentioned in the treaty.

The rights to hunt, fish, and gather include the use of modern techniques for obtaining wildlife. A tribe is limited only by two rules, other than those it creates for itself. First, the tribe cannot take so much wildlife that it endangers propagation (continuation) of the species in violation of state or federal

conservation laws. Second, the tribe cannot take any wildlife that Congress has prohibited it from taking.

Ceremonial Stone Landscapes. These landscapes of sacred significance are characterized by altered or moved stones. “Whether these stone structures are massive or small structures, stacked, stone rows, or effigies, these prayers in stone are often mistaken...as efforts of farmers clearing stones for agricultural or wall building purposes” (USET 2007). The National Register of Historic Places has acknowledged ceremonial stone landscapes as culturally significant to federally recognized tribes in the Northeast, pursuant to the tenets of the National Historic Preservation Act. Protocols for determining National Register eligibility for ceremonial stone landscapes is still developing. Additional research is warranted. Recording, listening, and making connections to oral histories, mapping ceremonial sites, researching early colonial land deeds, and developing an on-going communication with local tribes can also inform DCR management of these resources.

Within DCR’s forests and reservation are thousands of stone features and land forms of unknown origin and association. For the purposes of clarification, these sites have been inventoried and marked as archaeological sites of an “unknown” type, as opposed to “pre-Contact” or “post-Contact” sites. Further research may eventually reveal a cultural significance to these sites. For now, they are to be protected under DCR’s policy for cultural resources along with other identified archaeological sites in the Commonwealth.

Recreation Resources

Regulations guiding the recreational use of forests and parks may be found in 302 CMR 12.00. Key aspects of these and related regulations are identified below.

Activities Requiring Permits

Some recreational activities require either Special Use or Recreational Use permits. Special Use Permits are required for special activities and events such as concerts, charity walks, and community service projects. Recreational Use Permits are required for all group activities involving 25 or more people, and for such things as the use of pavilions, group use areas, and athletic fields and courts.

Additional information on these permits, and how they may be obtained, is available on DCR’s web page

(<http://www.mass.gov/eea/agencies/dcr/massparks/permits-rentals/dcr-permits.html>). Permits are also required for commercial activities (e.g., concessions, professional dog walking), film production, and commercial photography.

Swimming and Beach Use

Swimming is restricted to designated swimming areas. People, pets, and domesticated animals are prohibited from entering sensitive beach habitat posted as restricted. Pets and domesticated animals are prohibited from designated swim areas of inland beaches between April 1 and September 15. Additional rules of conduct may be found in 302 CMR 12.06.

Boating

Boating is regulated through a variety of Massachusetts Regulations (i.e., 323 CMR 2.00, 323 CMR 4.00, and 312 CMR 12; Appendix E). Allowed uses vary among parks and watercraft type; specific restrictions are identified in 302 CMR 12.07. Specific restrictions apply to several of the complexes’ properties. See Sections 2–13 for specific information.

Camping

There are no DCR campgrounds within the Complex. Cabins and tent platforms are available from the Appalachian Mountain Club at one property. Additional information is provided in *Section 2. Blue Hills Reservation*.

Hunting and Fishing

Hunting, fishing, and trapping are regulated through Massachusetts Regulations (321 CMR 3.00 and 321 CMR 4.00), DCR Parks and Recreation Rules (302 CMR 12.11), official Massachusetts Hunting, Freshwater Fishing, and Trapping Regulations that are promulgated annually. Summaries of these and other applicable regulations are presented in Appendix E. Officers from the Executive Office of Energy and Environmental Affairs’ Office of Law Enforcement (i.e., Massachusetts Environmental Police officers) enforce hunting, fishing, and OHV regulations.

All DCR properties are presumed to be open to hunting, fishing, and trapping unless otherwise specified in the Parks and Recreation Rules (302 CMR 12.11). Within the Complex, hunting and trapping are specifically prohibited or restricted at six parks. Park-specific information is provided in Sections 2–13.

Trail Use

General trail use is regulated through 302 CMR 12.00. The same regulations govern the use of horses and non-motorized vehicles on trails. Dogs may accompany trail users provided the animals are kept under control and do not interfere with any other park patron's enjoyment of DCR property. (302 CMR 12.13; Appendix E) Exceptions apply for service, hunting, and sled dogs.

With the exception of DCR, public safety, and utility company vehicles, motor vehicles are generally not permitted on trails in the Complex. OHVs are allowed in three of the Complex's forests. See Sections 6, 8, and 9 for additional information.

A March 15, 2011 Department of Justice ruling allows individuals with mobility disabilities to use "other power-driven mobility devices" on trails. Such devices include any device powered by batteries, fuel, or other engines that are used by individuals with mobility disabilities for the purpose of locomotion. Use of such devices may be restricted on trails due to factors such as: the type, size, weight, and speed of the device; the volume of pedestrian traffic; and the potential for substantial risk of serious harm to the environment or natural and cultural resources. No trails within the Complex have been assessed for their compatibility with these devices.

Geocaching

There is no Massachusetts regulation or agency policy on the placement of geocaches on DCR property. A BMP for managing the placement of geocaches on DCR properties has been in development for several years.

Infrastructure

Property Boundary

The Management Forester attempts to locate and mark property boundaries every 15 years. They also mark the boundaries of new properties as they are

acquired. Boundary marking typically involves locating and painting cement bounds or pipes, and the posting of boundary signs. The Forest and Park Supervisor at F. G. Hills monitors and marks the boundaries of properties under his control.

Buildings and Structures

The management of DCR-owned buildings is performed by DCR employees or contractors. Minor maintenance and repair is performed by on-site staff. More technical repairs (e.g., plumbing, electrical) are performed by DCR in-house trades staff or by trade or engineering contractors whose activities are coordinated through DCR's PSO Program. Major repairs are performed solely by licensed contractors.

Roads

The DCR maintains and repairs park roads and parkways. Management of traffic and related systems is supervised by the Parkways Section of the DCR's Engineering Bureau, and guided by American Association of State Highway and Transportation Officials standards; the Manual on Uniform Traffic Control Devices (MUTCD; FHA 2009); and the *Historic Parkway Preservation Treatment Guidelines* (DCR 2007a), if applicable. Public roads adjacent to DCR properties are maintained and repaired by either local municipalities or MassDOT.

Snow removal is performed by the DCR, MassDOT, and local municipalities. In general, municipalities or MassDOT plow public roads adjacent to parks and the DCR is responsible for plowing internal park roads.

Parking

The DCR is responsible for maintaining and repairing its parking areas. Most snow removal is performed by the DCR.

Multi-Use Paths

Ongoing maintenance and repair of paved and unpaved multi-use trails may be subject to review under a variety of environmental regulations (e.g., MESA, Wetlands Protection Act).

Trails

A variety of regulations and policies guide the management of trails. The design, management, and marking of trails are guided by the DCR's *Trails*

Guidelines and Best Practices Manual (DCR 2014a). In addition, BMPs address the closing and restoring of trails and trail maintenance (DCR n.d.e, n.d.f). Trail work is subject to both 950 CMR 70 (Appendix E) and the DCR Cultural Resource Policy (Appendix G).

Many trails in the Complex are located within Priority Habitat; all work on these trails must be reviewed and pre-approved by the NHESP. In order to avoid individual filings for every trail maintenance project, the DCR and NHESP produced a statewide assessment of areas of conflict between rare species and their habitats, and recreational trail maintenance activities (NHESP 2015). This assessment identifies specific maintenance activities that may take place on specific trail segments without additional NHESP review, and combinations of activities and locations that require full review. All maintenance activities must be performed in accordance with the guidance and restrictions contained in this assessment (NHESP 2015).

Additional regulations, such as the Massachusetts Wetlands Protection Act may also apply, depending on location. These regulations and policies apply to DCR employee, partner, and volunteer activities. If work is to be performed by volunteers it must also be consistent with DCR volunteer guidelines (DCR 2014b).

Kiosks and Signs

The format and placement of regulatory and informational signs are governed by the MUTCD (FHA 2009) and guided by the DCR *Graphics Standards Manual* (DCR n.d.g). The design and construction of kiosks are solely governed by the graphics manual.

Informational kiosks are managed by park staff as new information becomes available; they also perform kiosk installation and repair.

Memorials and Markers

The placement or removal of memorials and plaques is prohibited unless authorized by the DCR. (302 CMR 12.04(26); Appendix E). Notable markers in the Complex, such as those identifying properties on the National Register of Historic Places, are identified in the individual chapters. Other markers,

such as memorial benches or gardens, are not identified.

Land and Water Conservation Fund

Park lands acquired or developed with funding from the Land and Water Conservation Fund, a federal program administered by the National Park Service (NPS), must comply with a variety of requirements. This includes keeping the property boundary intact, using the property for outdoor recreation purposes, inspections by the NPS at least once every five years, and the posting of signs acknowledging the financial support of the Land and Water Conservation Fund. A full listing of program requirements is provided in NPS (2008). Properties acquired or developed with LWCF funds are identified in Table 1.10.1.

Table 1.10.1. Parks and facilities within the Blue Hills Complex funded through the Land and Water Conservation Fund.

Park or Facility	Year	Amount (\$)
Blue Hills Reservation	1966	2,809.45
Blue Hills Reservation	1968	342,601.60
Borderland State Park	1971	600,000.00
Manning Pool	1972	220,423.10
Spatcher Pool	1972	187,500.00

Management Resources

Volunteers

Volunteer activities in parks must be consistent with DCR guidelines (DCR 2014b), including completion of a Volunteer/Stewardship Agreement. Additional information may be found at: <http://www.mass.gov/eea/agencies/dcr/get-involved/volunteer-ops/dcr-volunteer-in-parks-program-guide.html>.

Landscape Designations

The types of activities that may take place on DCR parks are also guided by DCR's landscape designations. Lands are designated as Reserve, Parkland, or Woodland; each "has its own set of ecosystem services and management priorities" These designations influence such things as forestry practices and the types and level of allowable recreation. (DCR 2012a). Readers are directed to *Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines* (DCR 2012a) for details on how these designations

affect park use and management, and for maps. The number of acres of Reserve, Parkland, and Woodland in each park is presented in DCR (2012b).

Land Stewardship Zoning

At the property scale, management guidance is developed and applied through the resource management planning process. All areas within a park are placed into one of three Land Stewardship Zones (LSZs). These zones ensure resource protection based on site-specific field data, and provide guidance for current and future management based upon resource significance and sensitivities. These zones may be briefly categorized as follows:

- Zone 1 encompasses areas with highly sensitive natural and cultural resources that require special management approaches and practices to protect and preserve their special values.
- Zone 2 encompasses stable yet important natural and cultural resources. Within this zone, public recreation may typically be managed at sustainable levels.
- Zone 3 encompasses already developed landscapes or areas that may be suitable for future development as intensive use areas.

Land Stewardship Zoning is applied in a manner consistent with a property's Landscape Designation(s). Detailed information on the relationship between Land Stewardship Zones and

Landscape Designations may be found in Appendix 4 of DCR (2012a).

LSZs may be supplemented with Significant Feature Overlays that identify resources with specialized management needs. Every major property within the Complex (i.e., Sections 2–13) has been zoned; only about half of the properties have a Significant Feature Overlay.

1.11. RECOMMENDATIONS

Three priority management recommendations were developed for the entire Blue Hills Complex. (Table 1.11.1) For a recommendation to be considered priority it must address one or more of the following criteria:

- Regulatory compliance or compliance with legal agreements.
- Threats to the health and safety of park visitors and employees.
- The imminent loss of a natural, cultural, or recreation resource.

Additional maintenance and management needs observed during the preparation of this RMP, but not meeting one or more of the above criteria, are not included in this plan.

The following recommendations are of equal priority.

Table 1.11.1. Priority management recommendations for the Blue Hills Complex.

Recommendation	Implementation ^a
Conduct regular monitoring of properties in which the DCR has a legal interest (i.e., conservation restriction, easement) for consistency with agreements.	P, R, V
Brief field operations personnel about their role in dam maintenance, and develop and implement a systematic, Complex-wide approach to dam maintenance to be performed by the Field Operations Team.	D, P, R
Contact the Office of Cultural Resources before starting any project beyond those described in the BMPs that may impact cultural resources identified in this RMP.	P, R

a. The following codes identify the party or parties responsible for implementing the recommendations: B = Bureau of Ranger Services; C = Contractor; D = Office of Dam Safety; E = Division of Engineering; F = Bureau of Forest Fire Control and Forestry; L = Legal Services; O = Other; P = Bureau of Planning, Design & Resource Protection; R = Regional and district staff; S = Park Support Operations; U = Universal Access Program; V = Volunteer or partner; and X = Office of External Affairs and Partnerships.

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